MICHIGAN DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT

INTEROFFICE COMMUNICATION

TO: Wendy Jansma, Supervisor, West Unit, Revolving Loan Section

FROM: Cindy Clendenon, Project Manager, West Unit

DATE: March 1, 2011

SUBJECT: Drinking Water Revolving Fund (DWRF)
City of Allegan - Qualification for Green Project Reserve Funding
DWRF 7361-01 (Phase Two)

The purpose of this memo is to document the basis for determining the amount of DWRF loan forgiveness for the above-referenced project. The following information was used to make this determination.

As-Bid Non-Green Construction Costs for River Crossing, and Percent of Total Construction	$72,106.50	13.55%
As-Bid Green Construction Costs for Water Mains, and Percent of Total Construction	$460,013.79	86.45%
Total Project Cost for Construction and Nonconstruction (as per State-approved Alternative Justifiable Expenditure)	$725,000	na
Green Portion of Total Project Cost	0.8645 x $725,000	$626,756.78
Loan Forgiveness at 40%	0.4000 x $626,756.78	$250,702.71
Non-Green Portion of Total Project Cost	0.1355 x $725,000	$98,243.22
Loan Forgiveness at 15%	0.1500 x $98,243.22	$14,736.48
Total Allowable Loan Forgiveness	$250,702.71 + $14,736.48	$265,439.19

cc: Sonya Butler, DNRE

Drinking Water Revolving Fund
Green Project Reserve Qualification Template

Applicant: **City of Allegan** Project No: **7328-01** 7361 jc

Project Name: **Water System Improvements (Phase 2)**

Identify by page number from the project plan, or attach excerpts, where water efficiency or energy efficiency improvement justification is provided or discussed to support the need for the recommended green project reserve component: **(see attached)**. Please ensure all requested information is provided to enable an assessment by the Michigan Department of Natural Resources and Environment (DNRE) of whether the project or project component can qualify for funding from the green project reserve.

Water Main Replacement

1. Over the last ten years, **30** water main breaks have occurred on the water mains that are proposed for replacement, an average of **2.05** breaks/mile/year.

2. Identify the length, diameter, age and type of pipe to be replaced: **7,700' of 4" diameter lead joint cast iron pipe, 60 – 100 years old.**

3. Each break is estimated to result in the average loss of **100,000** gallons of water, calculated to total **205,000 gallons/year (due to breaks)** of water lost for those water mains.

4. Present the data indicating how this is a significant source of water loss in the system and how the pipes proposed for replacement are likely to generate the greatest return in leak reduction. **Total system water loss averages 65 MG per year, which is 17.6% of the total water produced. Water department staff indicated that only one break was recorded over the last ten years that was not on the older cast iron pipe which represents 25% of the total length of water mains in the system. Therefore it is assumed that 80% of the water loss is occurring in that 25% of the system. This project proposes to replace 7,700' of the 50,530' of older mains in the system, which is 15%. Based on those assumptions, this project should eliminate 15% of 80% of 65MG per year which equals 7.8 MG.**

5. The energy savings from pumping/delivering water through the new water mains versus the old ones is estimated at ____* __KwH/year.
   *** While it is difficult to determine the energy savings due to pumping water through larger pipes with higher C factors, it can be reasoned that total system electrical costs of $95,000 will be reduced by 2.1% (the projected water loss eliminated by the water main replacement), which amounts to annual energy savings of $1,995.**
6. Describe the condition of the replaced mains with respect to friction/head loss etc from tuberculation or other deterioration issues. As appropriate, identify if the soils are corrosive and contributing to the deterioration/breaks or leaks in the mains, and how

the replacement mains are designed to address future corrosion: **The 4" diameter cast iron mains replaced in the system to date have been found to have reduced capacity due to roughness and scale buildup inside the pipe. External corrosion has been typical of cast iron pipe of this age. Soils in the City are generally sand and gravel. Where clay or other corrosive soils are encountered, polywrap and clean sand backfill are specified to prevent future corrosion**

7. Total projects costs for the water main replacement component of the project are **$800,000**.

8. Identify the source of data used for these calculations: **Data was obtained from City of Allegan water treatment, pumpage and sales records, as well as water department maintenance records and interviews with water department staff.**

Submitted by:

James A. Cook, P.E.
Prein&Newhof

April 28, 2010

Business Case for Qualification of Project for Green Project Reserve

Applicant: City of Allegan

Project No.: ~~7328~~-01 7361 cjc

Project Name: Water System Improvements (Phase 2)

Summary

- Replacement of 7,700 feet of 4" diameter lead-jointed cast iron distribution pipe with new 8" diameter ductile iron pipe to eliminate the loss of 7.8 MGY (million gallons per year) ("green" portion), and construction of a 16" diameter river crossing from the Water Treatment Plant to downtown Allegan for reliability (non-"green" portion).
- Loan amount = $980,000.
- Water saving (green) portion of loan = $800,000 (81.6%).
- Annual water savings = 7.8 MG

Background

- The City of Allegan water distribution system includes 39 miles of pipe ranging in size from 2" to 16" diameter. The oldest water mains in the system are 9.6 miles of 2" to 8" diameter lead-jointed cast iron pipes which are from 60 to 100 years old. These older mains represent about 25% of the total distribution system.
- Water loss in the system has averaged 17.6% (65 MG out of 370 MG produced annually) since 2000.
- Maintenance records show essentially all breaks and leak repairs over the past ten years have been associated with the older mains. Staff estimates that at least 80% of the system water loss is associated with the older mains.
- This project will replace 7,700', or 15% of the older mains.

Calculated Water Loss

- By replacing 15% of the older pipe where 80% of the water loss is occurring, this project will eliminate 15% of 80% of 65 MGY, or 7.8 MGY.

Conclusion

- By replacing 7,700' of older 4" diameter lead jointed cast iron water main with new 8" diameter ductile iron water main, the City of Allegan will reduce system water loss from 65 MGY (17.6%) to 57.2 MGY (15.5%), a savings of 7.8 MGY(2.1%). The City will realize cost savings for treatment and pumping estimated at $10,000/year (7.8 MG @ $1,290/MG) in addition to cost savings associated with elimination of repairs to the old pipe. Lower energy usage will also result from replacing 4" diameter mains with a C factor of 80 with new 8" mains with a C factor of 120.